A gene regulatory network orchestrates neural crest formation.

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Authors: Tatjana Sauka-Spengler, Marianne Bronner-Fraser

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Public Summary:
We review the gene regulatory interactions involved in formation of neural crest cells in vertebrate embryos, combining data from a number of experimental organisms.

Scientific Abstract:
The neural crest is a multipotent, migratory cell population that is unique to vertebrate embryos and gives rise to many derivatives, ranging from the peripheral nervous system to the craniofacial skeleton and pigment cells. A multimodule gene regulatory network mediates the complex process of neural crest formation, which involves the early induction and maintenance of the precursor pool, emigration of the neural crest progenitors from the neural tube via an epithelial to mesenchymal transition, migration of progenitor cells along distinct pathways and overt differentiation into diverse cell types. Here, we review our current understanding of these processes and discuss the molecular players that are involved in the neural crest gene regulatory network.